Durham University

# Durham Research Online

## Deposited in DRO:

23 June 2019

## Version of attached file:

Accepted Version

## Peer-review status of attached file:

Peer-reviewed

## Citation for published item:

Jõgela, Joana and Uri, Asko and Pålsson, Lars-Olof and Enkvist, Erki (2019) 'Almost complete radiationless energy transfer from excited triplet state of a dim phosphor to a covalently linked adjacent fluorescent dye in purely organic tandem luminophores doped into PVA matrix.', Journal of materials chemistry C., 7 (22). pp. 6571-6577.

## Further information on publisher's website:

https://doi.org/10.1039/C8TC05325A

## Publisher's copyright statement:

## Additional information:

## Use policy

The full-text may be used and/or reproduced, and given to third parties in any format or medium, without prior permission or charge, for personal research or study, educational, or not-for-profit purposes provided that:

- a full bibliographic reference is made to the original source
- a link is made to the metadata record in DRO
- the full-text is not changed in any way

The full-text must not be sold in any format or medium without the formal permission of the copyright holders.

Please consult the full DRO policy for further details.

Durham University Library, Stockton Road, Durham DH1 3LY, United Kingdom
Tel : +44 (0)191 334 3042 | Fax : +44 (0)191 334 2971
https://dro.dur.ac.uk

**Supporting Information**

# Complete radiationless energy transfer from excited triplet state of a dim phosphor to a covalently linked adjacent fluorescent dye in purely organic tandem luminophores

Joana Jõgela,[1] Asko Uri,[1] Lars-Olof Pålsson,[2] and Erki Enkvist[1*]

[1]Institute of Chemistry, University of Tartu, 14A Ravila St., 50411 Tartu

[2]Department of Chemistry, University of Durham, Durham, UK DH1 3LE, United Kingdom

*E-mail: Erki.Enkvist@ut.ee

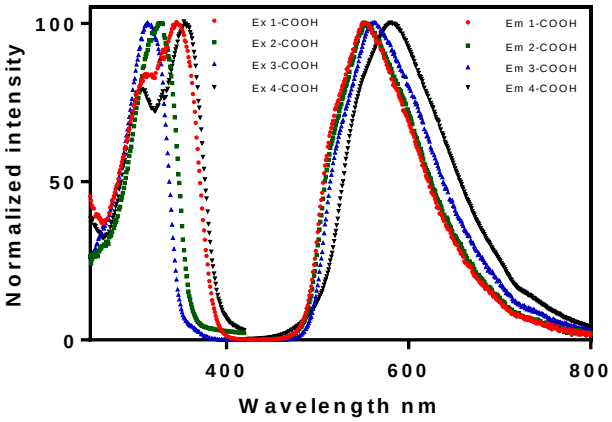



Figure SI1. Excitation and emission spectra of phosphorescence of carboxylic acid analogues of **1**-**4**. 6-10 nmol of **1** - **4** in 0.7 mg of PVA *per* well were used.

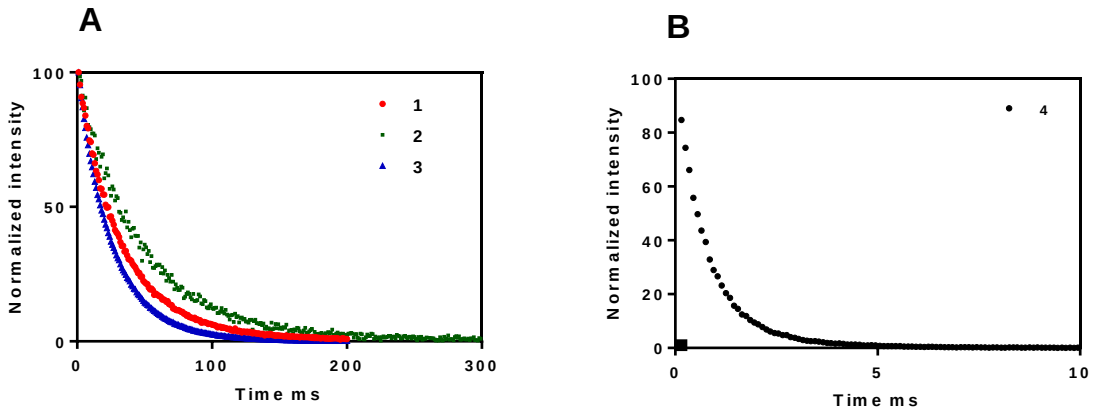



Figure SI2. Phosphorescence decays of **1**-**3** (A) and **4** (B) in PVA.

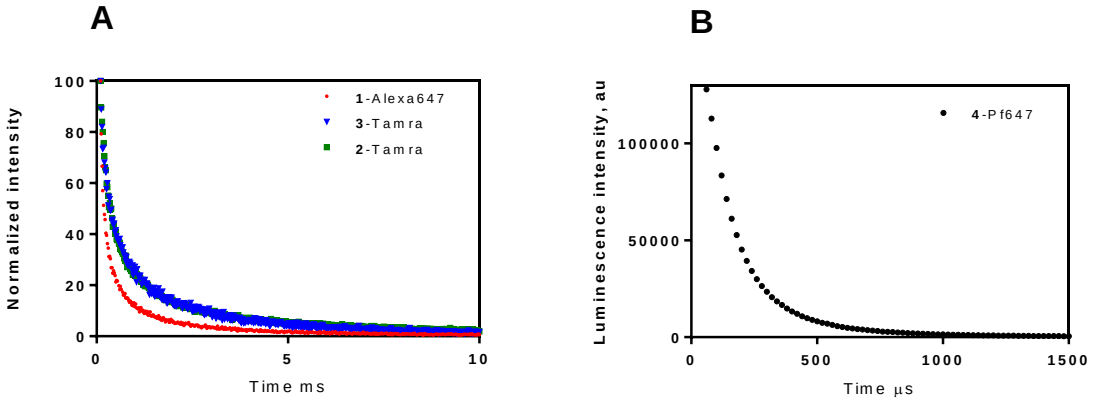



Figure SI3. Luminescence decays of donor-acceptor compounds in PVA.

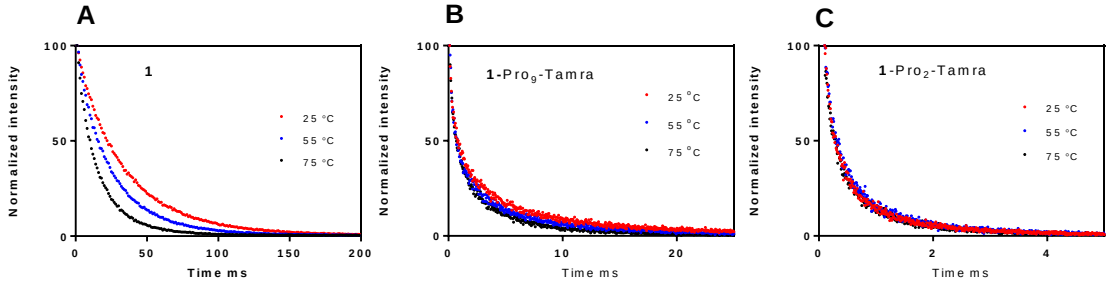



Figure SI4. Temperature dependence of luminescence decays of compounds in PVA.

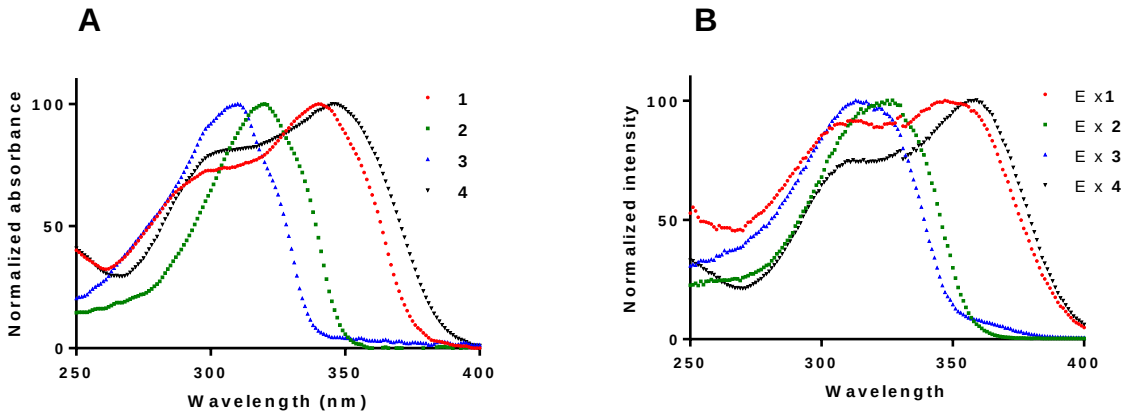
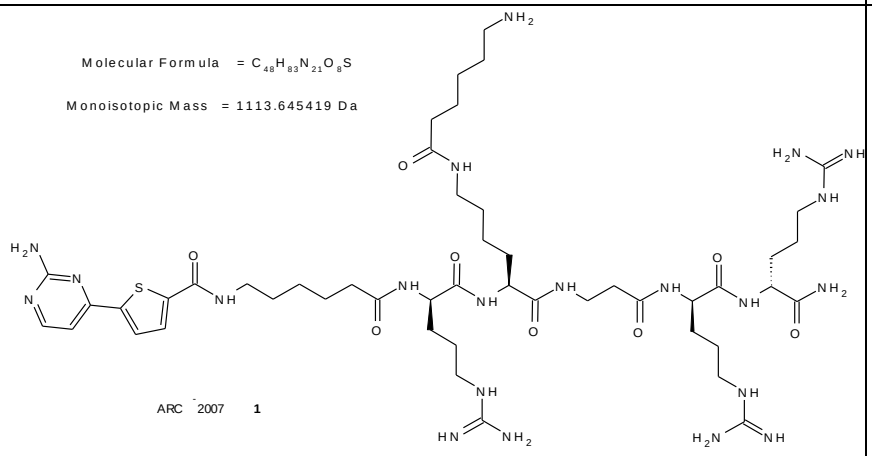
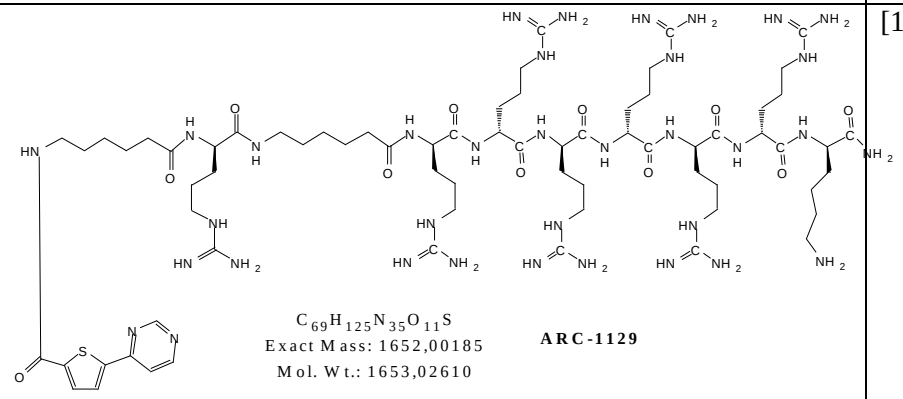
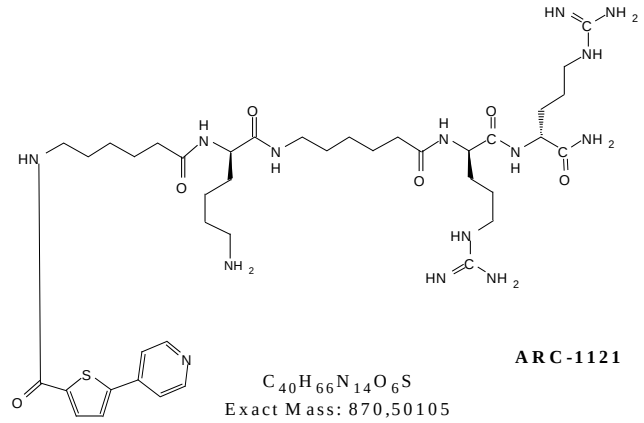
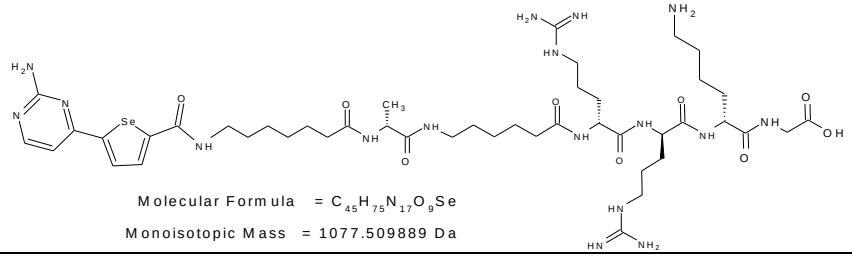
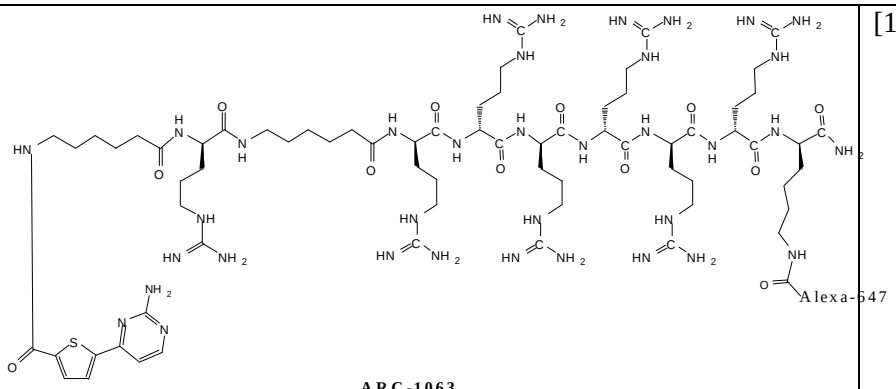
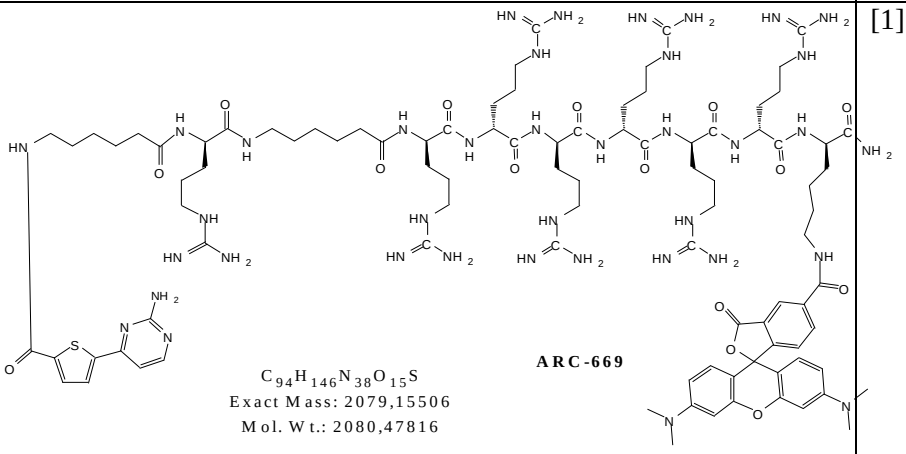
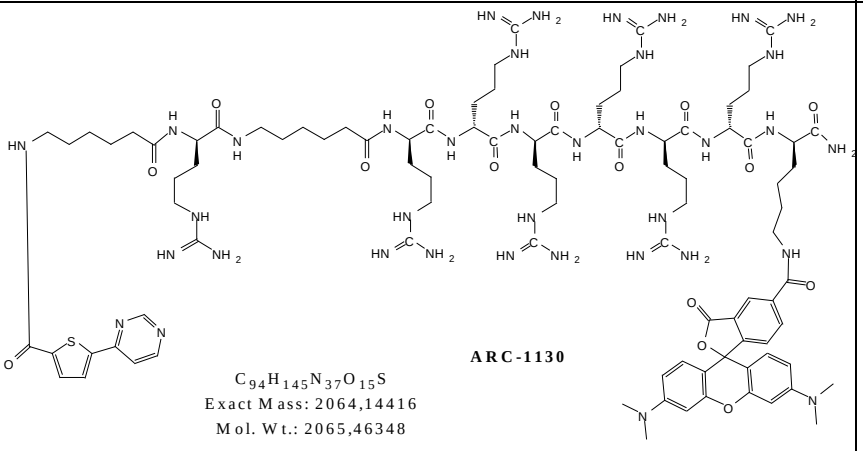
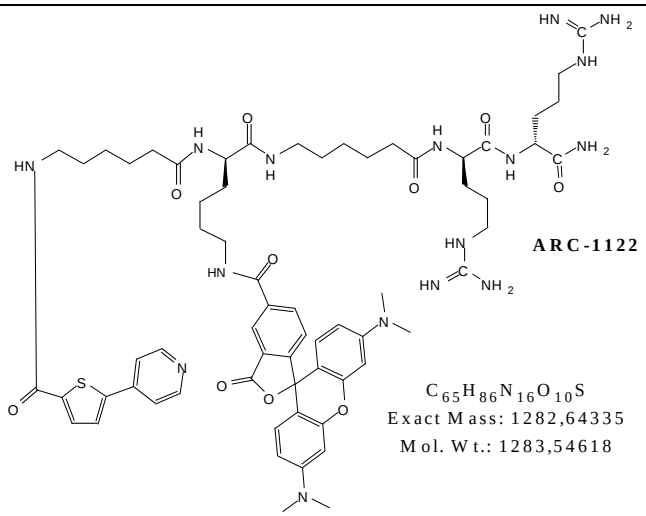
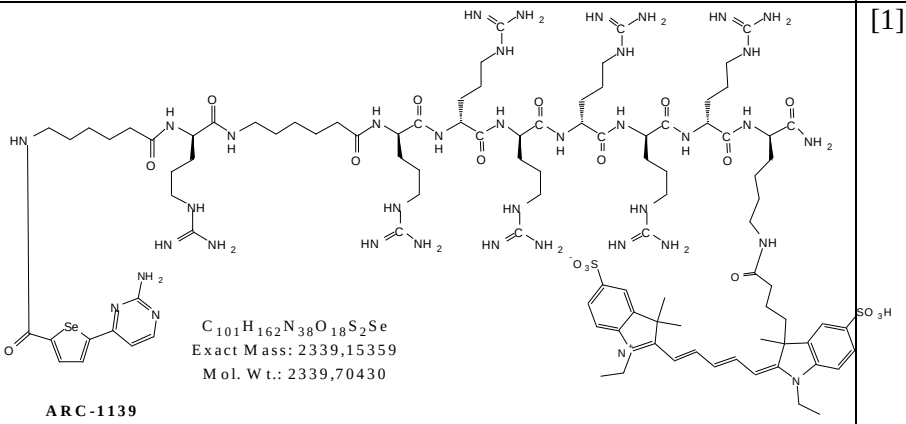
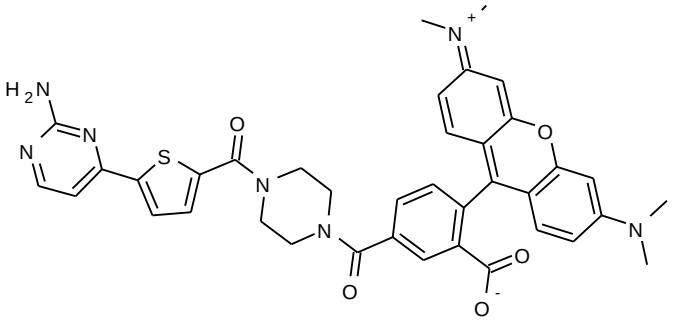


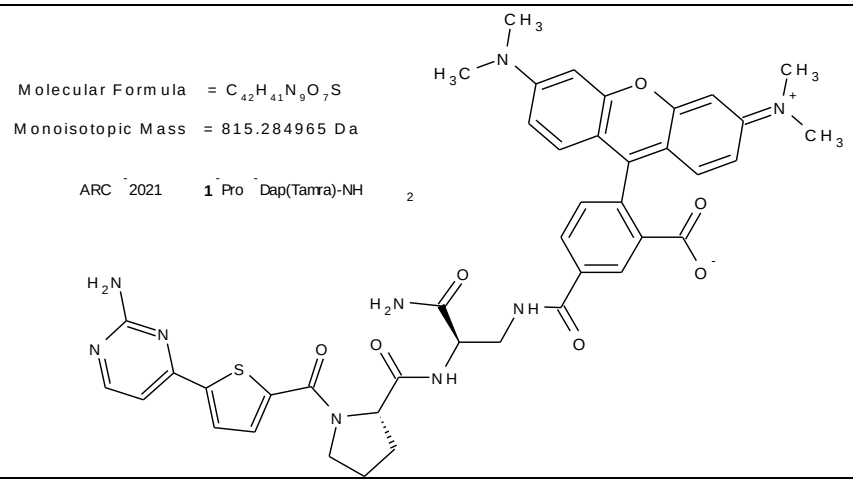
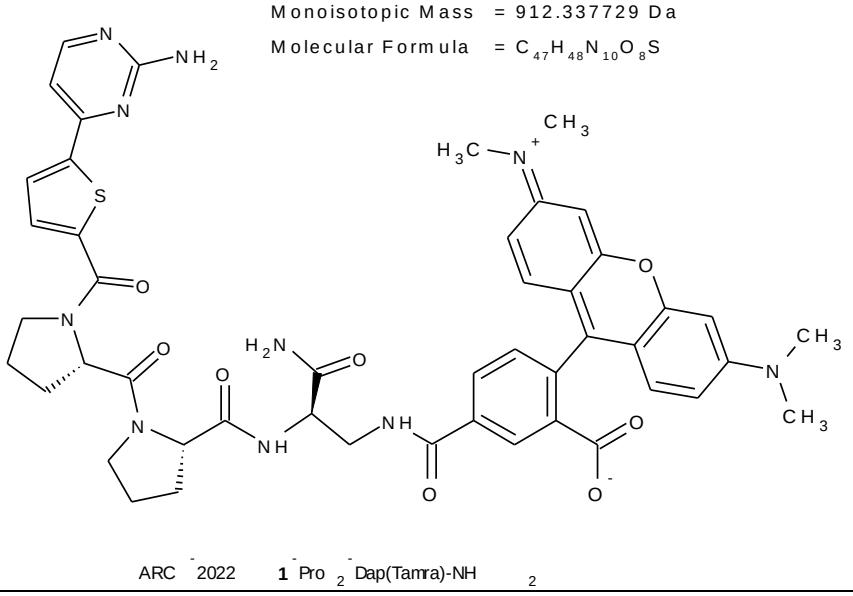
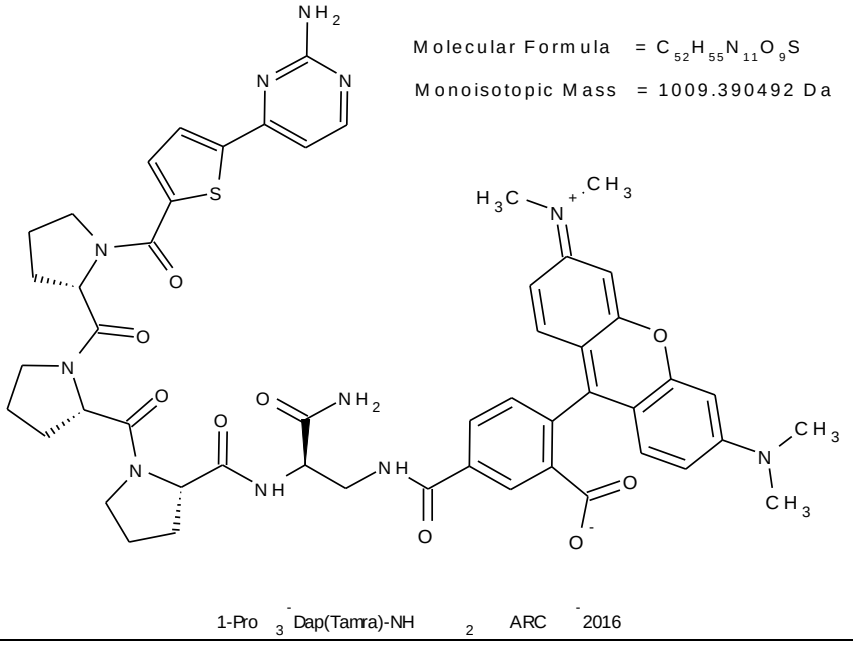

Figure SI5. A) Normalized UV-spectra of **1** – **4**. B) Normalized phosphorescence excitation spectra of **1** – **4**. Minor differences between absorption and excitation spectra are probably mainly caused by slit width used in the measurements of excitation spectra.

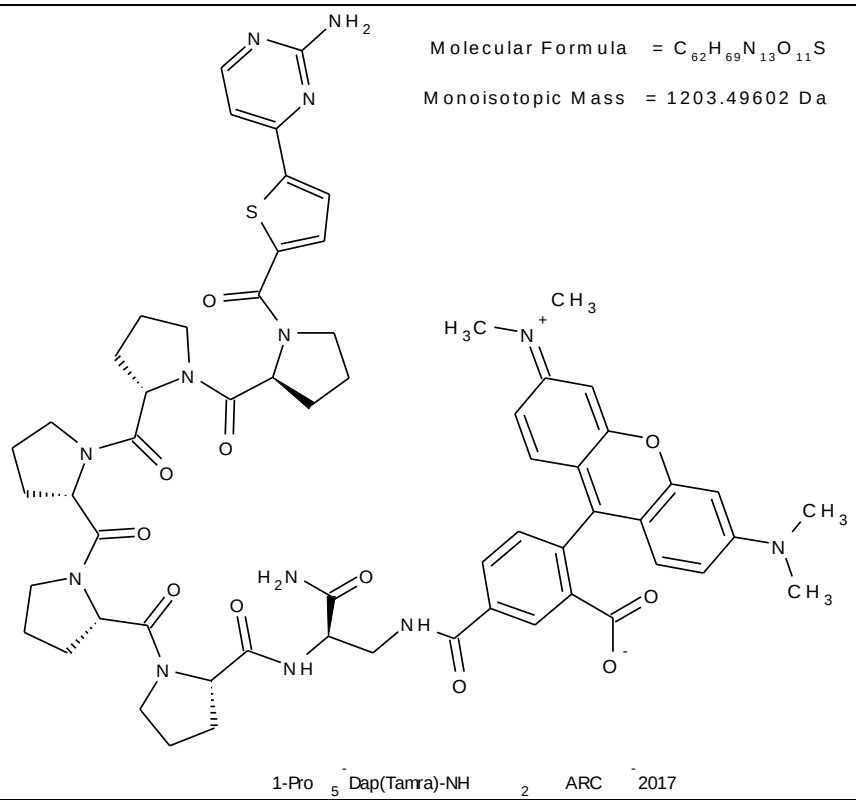
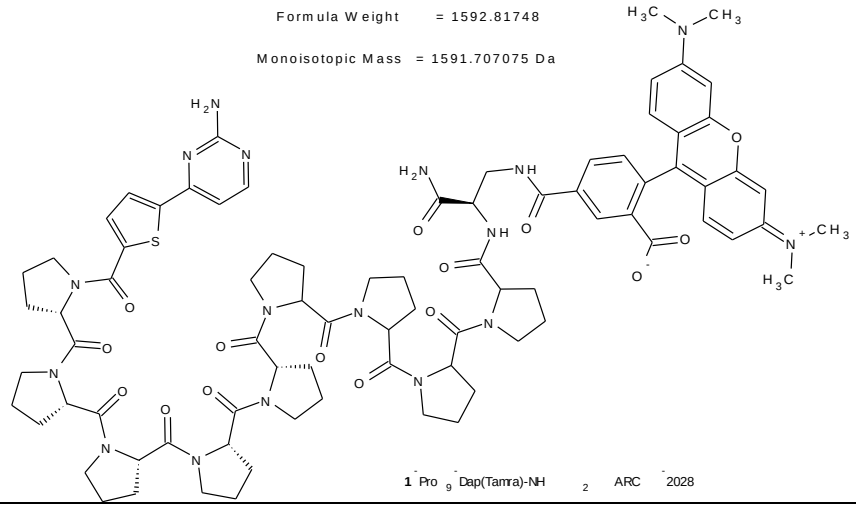
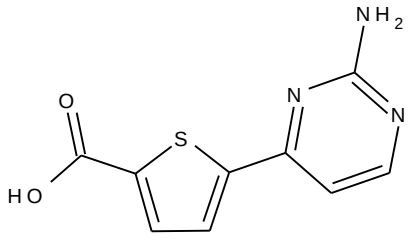
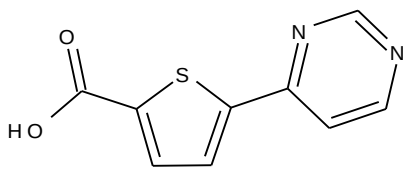
SI Table 1. Table of full structures

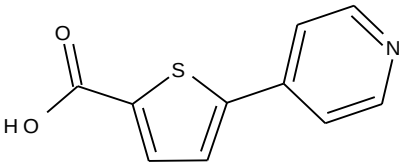
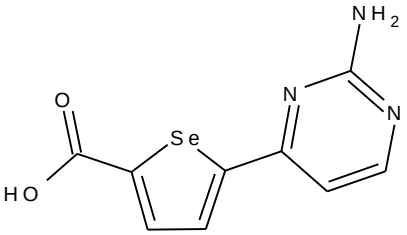
| Compound codes | Structure | Reference or HRMS |
|---|---|---|
| **1** (ARC-2007) |  | 1113.6447 |
| **2** (ARC-1129) |  | [1] |
| **3** (ARC-1121) |  | [1] |
| **4** (ARC-1180) |  | 1077.5105 |

| | | |
|---|---|---|
| **1**-Alexa647 (ARC-1063) |  **ARC-1063** | [1] |
| **1**-Tamra (ARC-669) |  $C_{94}H_{146}N_{38}O_{15}S$ Exact Mass: 2079,15506 Mol. Wt.: 2080,47816 **ARC-669** | [1] |
| **2**-Tamra (ARC-1130) |  $C_{94}H_{145}N_{37}O_{15}S$ Exact Mass: 2064,14416 Mol. Wt.: 2065,46348 **ARC-1130** | [1] |

| | | |
|---|---|---|
| **3**-Tamra (ARC-1122) |  | [1] |
| **4**-PF647 (ARC-1139) |  | [1] |
| **1**-Pip-Tamra (ARC-2024) | Molecular Formula = $C_{38}H_{35}N_7O_5S$<br>Monoisotopic Mass = 701.242037 Da<br>  <br>ARC - 2024 **1** - Pip - Tamra | 701.2405 |

| | | |
|---|---|---|
| **1**-Pro-Dap(Tamra)-$NH_2$ (ARC-2021) |  | 815.2837 |
| **1**-$Pro_2$-Dap(Tamra)-$NH_2$ (ARC-2021) |  | 912.3369 |
| **1**-$Pro_3$-Dap(Tamra)-$NH_2$ (ARC-2016) |  | 1009.3886 |

| | | |
|---|---|---|
| **1**-Pro$_5$-Dap(Tamra)-NH$_2$ (ARC-2017) |  | 1203.4968 |
| **1**-Pro$_9$-Dap(Tamra)-NH$_2$ (ARC-2028) |  | 1591.7086 |
| **1**-COOH |  | [1] |
| **2**-COOH |  | [1] |

| | | |
|---|---|---|
| **3**-COOH |  | [1] |
| **4**-COOH |  | [1] |

## SI references


1) E. Enkvist, A. Vaasa, M. Kasari, M. Kriisa, T. Ivan, K. Ligi, G. Raidaru, A. Uri, *ACS Chem. Biol*. **2011**, *6*, 1052 –1062.